

S P E C I F I C A T I O N

MULTI-PLY SUPPORT MEMBER

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The field of the present invention is columnar support structures made from wood, such as legs used for various types of furniture and architectural support columns.

2. Background

[0002] Wood is often crafted into a wide variety of everyday products. The type of wood used to create these everyday products may be dependant upon many factors, such as the availability of the desired wood, the appearance of the final product, and the appropriateness of the certain woods for particular products. The type of wood, the skill of the craftsman, and the tools used all add to the quality of the final product, which may be as simple as a small jewelry box or as complex as an architectural structure. Throughout the entire crafting process, how the grain of the wood is oriented is a factor which is almost always taken into consideration for every crafted wood product. The orientation of the grain, along with the cuts and carvings made to expose the grain, provides much of the allure imbued in wood products. In addition, the orientation of the grain also gives wood products inherent strength and weakness. Generally, wood is capable of withstanding more pressure along the direction of the grain than transverse to the direction of the grain. Pressure transverse to the direction of the grain, if sufficient for a given wood product, may damage and possibly break the product. However, even pressure applied in the direction of the grain, if applied locally near an edge, may damage wood by causing splintering.

[0003] Plywood addresses some of the weakness that is exhibited by natural wood. Plywood adds strength to wood constructions by gluing together sheets of wood, each individual sheet being a single “ply”, with adjacent plies having grain running in different directions. Typically, the grain of one ply is set orthogonal to the grains of adjacent plies to maximize the strength of the plywood. Because of its usual appearance and the quality of the wood typically used in its construction, plywood is viewed by many as an unattractive and cheap replacement for wood in crafted products. For this reason, plywood is primarily used in sheet form for non-cosmetic applications such as base floor, roof, and wall coverings and covered or painted furnishings where sheets of wood are appropriate. Given this primary use of plywood, some of its true strength remains unutilized.

SUMMARY OF THE INVENTION

[0004] The present invention is directed towards a multi-ply support member. Each wood ply is joined to at least one other ply at one of a plurality of interfaces. The grain of each wood ply is oriented in a different direction as compared to grains of adjacent plies. The support member is formed to include a tenon portion atop a body portion, wherein the tenon portion may be inserted into the mortise of a structure to be supported.

[0005] The tenon portion may include one or more distinct sub-portions. Where the tenon portion is unitary, the tenon portion extends outwardly from one or more sides of the body portion and may extend outwardly by a distance that is at least as great as a width of the body portion. Where the tenon portion includes at least two sub-portions, for example a first tenon portion atop a second tenon portion, at least the second tenon portion extends outwardly from one or more sides of the body portion and may extend outwardly by a distance that is at least as great as a width of the body portion. The first

tenon portion may be similarly proportioned to the body portion, except in the longitudinal direction of the support member.

[0006] For a multi-ply support member which is incorporated into a movable product, such as furniture, a foot protector may be included to reduce or prevent splintering at the foot portion of the support member.

[0007] Accordingly, it is an object of the present invention to provide a multi-ply support member. Other objects and advantages will appear hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] In the drawings, wherein like reference numerals refer to similar components:

Fig. 1 is a perspective view of a support member in accordance with an embodiment of the invention;

Fig. 2 is a schematic view of the plies in the support member of Fig. 1;

Fig. 3 is a plan view of the support member of Fig. 1;

Fig. 4 is a cross-sectional view of the support member of Fig. 1 engaged with a surface being supported;

Fig. 5 is a cross-sectional view of a lower portion of the support member, along the line 5–5 of Fig. 3, showing the foot protector; and

Fig. 6 is a perspective view of the foot protector of Fig. 5.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0009] Turning in detail to the drawings, Fig. 1 illustrates a multi-ply support structure in the form of a table leg 10. The leg 10 comprises a plurality of layers of wood plies 12 joined at a plurality of interfaces 14. The wood plies 12 are joined using methods that are generally known to those skilled in the art. The interfaces 14 run substantially parallel to the longitudinal direction of the leg 10, which is indicated by the

arrow LD. Alternatively, the interfaces may have any alignment relative to the longitudinal direction of the leg 10. The orientation of the interfaces illustrated in Fig. 1 is chosen to simplify production.

[0010] Fig. 2 schematically illustrates the orientation of the wood grains in the plies 12 of Fig. 1. Five plies 12 are illustrated in Fig. 2, with three being indicated by the label A and two being indicated by the label B. Those plies labeled A are oriented with the grain generally in the direction of the arrow bearing the label A. Those plies labeled B are oriented with the grain generally in the direction of the arrow bearing the label B. Thus, the grain of each ply 12 is approximately orthogonal to grains of adjacent plies.

[0011] When joining the plies, more or fewer may be included in a support member as is appropriate, depending upon the use for which it is employed. The numbers of plies illustrated in Figs. 1 and 2 are for purposes of illustration only. Similarly, the grain orientation for each of the individual plies may also vary. As a general rule, the closer to orthogonal the grain of each ply is to grains of adjacent plies, the stronger the final product will be.

[0012] Returning to Fig. 1, the leg 10 is formed to include a first tenon portion 18, a second tenon portion 20, a body portion 22, and a foot portion 24. The second tenon portion 20 extends outward on two sides of the leg 10 from between the first tenon portion 18 and the body portion 22. Optionally, the first tenon portion, the foot portion, and the foot protector may be omitted from a support structure as is appropriate or desired. For example, if the support member is intended to be stationary, like an architectural support column, then the foot portion and the foot protector are unnecessary. Similarly, a single tenon portion may be sufficient to affix the support member to the structure it is intended to support, thereby eliminating the need for the first tenon portion.

[0013] The first tenon portion 18, the second tenon portion 20, and the body portion 22 are formed having the same number of plies, resulting in each portion having the same depth as the other portions. As shown in Fig. 5, the foot portion 24 is formed with fewer plies than the body portion so that the foot protector 26 is flush with the body portion 22. Alternatively, all portions of the leg 10 may be formed having a non-uniform depth to achieve desired structural or aesthetic properties. Additionally, while the leg 10 is shown to have a generally rectangular cross-section, the leg may be crafted to have any desired cross-section, uniform or non-uniform.

[0014] Turning to Fig. 3, the body portion 22 and the first tenon portion 18 are formed having the same width, w . Similarly, the width of the foot portion 24 is such that the foot protector 26 has the same width, w . The second tenon portion 20 extends outward from the body portion by a distance, w' , where $w' > w$. The relationship between w and w' may be varied as appropriate for any particular design. For example, w' may be less than w or w' may more than twice w . Regardless of how far the second tenon portion extends outward, the multiple plies of the support member provide the second tenon portion strength to bear more weight than a support member having wood grain oriented in a single direction. As with the depth of the each portion of the leg, each portion may be formed having a non-uniform width to achieve desired structural or aesthetic properties.

[0015] Fig. 4 shows the leg 10 as part of a table 30. The table top 32 includes a bi-level mortise 34 which is complimentary in shape to the first and second tenon portions 18, 20. Holes 36 in the second tenon portion 20 are aligned with screw holes in the table top 38 for securing the leg 10 to the table top 30. Alternatively, if the tolerances between the mortise 34 and the first and second tenon portions 18, 20 are sufficiently tight, the leg 10 may be secured to the table top 32 with a pressure fit or with glue.

[0016] Alternative configurations of the table top and mortise are possible. For example, the mortise need not pass through the entire height of the table top, thereby preserving the continuity of the top surface of the table top. As another example, the mortise may be formed to compliment only the first tenon portion, while the second tenon portion is secured to the underside of the table top with screws. Other alternative configurations will be apparent to those skilled in the art.

[0017] Turning to Figs. 5 and 6, Fig. 5 illustrates in cross-section the foot protector 26 disposed about the foot portion 24 of the leg 10 and Fig 6 illustrates the foot portion 24 in perspective. Like the leg 10, the foot protector 26 is formed from a plurality of wood plies 40 joined together in a manner known to those skilled in the art. The interior portion 42 of the foot protector 26 is cut out to allow the foot protector 26 to slide onto the foot portion 24 of the leg. Once in place, the foot protector 26 reduces or prevents splintering at the end of the foot portion 24 where the leg 10 rests on the floor. The foot protector 26, therefore, may be formed of any suitable material that is affixable to the leg and is capable of providing such splinter protection.

[0018] Thus, a multi-ply support member is disclosed. While an embodiment of this invention has been shown and described, it will be apparent to those skilled in the art that many more modifications are possible without departing from the inventive concepts herein. The invention, therefore, is not to be restricted except in the spirit of the following claims.